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November 28, 2005

Michael B. Flynn, Esq.
Flynn & Associates
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RE: Papadakis v. CSX
Our File No.: K021-05

Dear Mr. Flynn:

I have completed my initial analysis of the incident which is the subject of this lawsuit.
In the course of my analysis, I have reviewed the following items:

- 1) Faimont Harsco Manual
- 2) Harsco Truck Technical video
- 3) CSX incident report
- 4) Record on Vehicle No. 500285, including repair history, report of vehicle accident, Maaco repair records and 10/9/98 paperwork for unit
- 5) Transcript of recorded statement of Paul Papadakis
- 6) Pages from Kevin Krause's Maintenance Book
- 7) Deposition of Richard Ross w/exhibits
- 8) Deposition of Ronald Jette w/exhibits
- 9) Deposition of David Evers w/exhibits
- 10) Deposition of James Santillo w/exhibits
- 11) Deposition of Ernest Gailor w/exhibits
- 12) Deposition of Richard Spatafore w/exhibits
- 13) Deposition of James Lamb
- 14) Deposition of Peter Ebert w/exhibits
- 15) Deposition of Paul Papadakis w/exhibits
- 16) CSX personal injury report
- 17) Photos taken by Michael Flynn
- 18) Photos taken 2/15/05
- 19) Photos taken 9/24/04

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- 20) Plaintiff's Initial Disclosure
- 21) CSX's Initial Disclosure
- 22) Defendant's Expert Disclosure of Peter Ebert
- 23) CSX's Answers to First Set of Interrogatories 2/7/05
- 24) Plaintiff's Supplement to Initial Disclosure Statement
- 25) Plaintiff's answers to First Set of Interrogatories 3/3/05
- 26) CSX's First Supplemental Answer to Interrogatories 3/28/05
- 27) CSX's responses to Request for Admissions 8/3/05
- 28) CSX's Second Supplemental Answers to Interrogatories 10/14/05
- 29) CSX's Responses to Plaintiffs Request for Admissions
- 30) Personal inspection of CSX vehicle no. 500285 11/18/05
- 31) Field notes and photographs taken by me on 11/18/05

Mr. Papadakis described the incident in his deposition, stating that he encountered problems at the end of his route when trying to raise the left front hy-rail gear on his truck, unit 500285, on 6/13/01. He stated that he unlocked the locking pawl mechanism and released pressure on the gear using a bar in the top socket. He stated that he repositioned the bar into the bottom socket of the gear and raised the arm and wheel to its normal "up" position where it contacted the stop, and that the normal force on the bar which held the weight of the arm and guide wheel suddenly diminished and the arm and wheel fell back onto the rail. He further stated he performed this action additional times with the same result. He then described his actions to raise the arm and wheel and chain it to the undercarriage in a manner similar to the normal stowed position, i.e. with the arm rotated toward the rear of the vehicle. He never observed the arm rotated past vertical or toward the front of the vehicle. He stated his injury occurred while manually raising the arm and chaining it to the vehicle. Mr. Papadakis drove the vehicle back to his headquarters and did not report doing anything further to the vehicle.

Shortly after the incident, the vehicle was taken to T&T service and was inspected by Mr. Ebert and CSX employees. At the time of inspection, the left front arm and wheel were found chained up in a position such that the arm was rotated forward, toward the front of the vehicle. Mr. Ebert stated he unchained the arm and raised the vehicle such that the arm and wheel could be rotated back to the proper rear position and it then properly locked in the raised position. Mr. Ebert performed a mechanical inspection and found the hy-rail gear to be working properly and the rotation stop bolt to be adjusted properly. The truck was then returned to CSX.

Since no mechanical problems were observed with the locking pawl which holds the gear in both the down and up positions during the inspection, and the operation was found to be proper with no subsequent problems, there is no mechanical explanation for the problem Mr. Papadakis described with raising the gear. There is also a discrepancy with regard to the position

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the left front hy-rail gear arm was in following the incident. Mr. Papadakis stated he chained the arm back in the proper stowed position, rotated toward the rear of the truck, and that he never observed the arm rotated forward. It was subsequently found chained and rotated toward the front of the truck, opposite his description. Mr. Papadakis' description of events is inconsistent with all the mechanical evidence observed following the incident.

During inspection of the vehicle, the effect of overtravel of the upper socket during loading of the guide wheel was investigated. With additional force, the shaft connected to the socket and stop arm can be rotated beyond the point the locking pawl engages. This can then cause the stop bolt on the stop arm to contact and become wedged against the steel cross channel which spans the back of the hy-rail gear. The effect of this overtravel is to twist the rubber torsion spring further than normal and put additional downward load on the arm and guide wheel. Mr. Papadakis stated he believed the left front arm was not angled rearward as much as the other wheel positions, which is consistent with additional load being applied due to overtravel. Because the stop bolt has a tapered nose before the threads start, it will wedge against the cross channel in the "apply" direction, but then the threads of the bolt dig into the softer metal of the channel and prevent rotation back in the opposite direction. This prevents unloading the gear and releasing the locking pawl, leaving the gear stuck in the down position. Thread marks were observed on the cross channel during inspection, indicating this had happened in the past. In order to unwedge the bolt, free the stop arm and rotate the socket back to the point the locking pawl can be released, the vehicle must be raised to allow the arm and guide wheel to drop and remove some of the load on the arm. The arm and guide wheel can then be raised and locked in the proper "up" position. If the vehicle is lifted enough that the arm can become vertical without releasing the load, it will rotate beyond vertical, causing the arm to be angled forward.

The locking pawl handle engages one of two slots in a wheel on the main shaft for the down and loaded position and up position. There is a torsion spring to cause the handle to automatically engage the slots. When the main shaft reaches either the proper down and loaded position or up position, the handle visibly and audibly snaps into the slot. Any forced overtravel will occur after the handle has snapped and locked into the slot.

The most likely sequence of events in the subject incident is that when Mr. Papadakis put the left front hy-rail gear down, he continued to rotate the upper socket with the bar after the locking pawl snapped into position and caused the stop bolt to wedge against the cross channel. This put additional load on the left front guide wheel and caused the arm to rotate more forward than the other front arm, as described by Mr. Papadakis. Despite this condition, the vehicle would operate properly on the rails and the left front arm would not rotate far enough forward to go "over-center". At the end of travel on the rails, the upper socket could not be rotated to unload the guide wheel because of the wedged condition. The vehicle was then either derailed or raised enough to allow the arm to rotate forward and go over center, angled toward the front of

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the vehicle. The arm and guide wheel were then chained up in this configuration to allow the vehicle to be driven back to headquarters where it was observed in this same condition.

Based on the observations and analysis contained herein and my knowledge, experience and training, I believe the following opinions to be correct to a reasonable degree of engineering certainty:

- 1) The sequence of events described by Mr. Papadakis is not possible if the mechanical condition of the truck was as described by Mr. Ebert following his inspection or as observed during my inspection.
- 2) When lowering the left front hy-rail gear at the beginning of his on-rail travel, Mr. Papadakis continued to rotate the upper socket after the locking pawl handle had snapped into position, causing overtravel of the stop arm. During this overtravel, Mr. Papadakis also applied ever increasing and excessive force above and beyond the normal amount required.
- 3) As an experienced operator, Mr. Papadakis should have observed, felt and heard the locking pawl handle engage at the proper point.
- 4) As an experienced operator, Mr. Papadakis should have observed the additional rotation of the socket beyond normal and felt the additional and excessive force he was applying after the locking pawl handle engaged.
- 5) The overtravel of the socket caused the stop bolt to wedge against the cross channel, causing the left front guide wheel to be stuck in the down position.
- 6) When Mr. Papadakis tried to raise the left front hy-rail gear at the end of his on-rail travel, he could not move the upper socket to release the load on the gear.
- 7) Mr. Papadakis either derailed his vehicle or raised the left front to the point where the arm and wheel rotated forward beyond vertical.
- 8) Mr. Papadakis chained the arm and wheel in the forward position and returned to his headquarters.
- 9) The sole cause of the incident was the negligent operation of the hy-rail gear by Mr. Papadakis.

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The above opinions are based on information reviewed to date and may be modified, amplified or changed upon review of additional materials.

A copy of my current curriculum vitae and trial and deposition testimony history for the last four years are attached. My professional fee for all tasks undertaken is \$295/hr.

Very truly yours,

KENT ENGINEERING

A handwritten signature in black ink, appearing to read "Joe W. Kent", written in a cursive style.

Joe W. Kent, P.E.

Attachments